



ENVS*4360 Glacial Environments

Winter 2019

Section(s): C01

School of Environmental Sciences

Credit Weight: 0.50

Version 1.00 - January 07, 2019

1 Course Details

1.1 Calendar Description

This course will explore modern to ancient glacial environments, focusing on the sedimentary record they leave behind and applications of glacial geology including reconstructing past environments, examining how glacial deposits affect the distribution of resources or groundwater contaminants, and discovering the response of glaciers to recent and past climate change. Students will develop skills in critically evaluating literature and geological data, description and identification of glacial deposits.

Pre-Requisite(s): ENVS*2400 or ENVS*3180

1.2 Timetable

Lectures: MW 1:30-2:20

Seminars: F 11:30-1:20

1.3 Final Exam

Final examination date and time: Friday April 12th from 2:30-4:30. Check university website later in the semester for exam location.

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Emmanuelle Arnaud
Email:	earnaud@uoguelph.ca
Telephone:	+1-519-824-4120 x58087
Office:	ALEX (AXEL) 126

Office Hours:	Please contact me via email to make an appointment.
Lab Co-ordinator:	Alyson Brown
Email:	alysonb@uoguelph.ca
Telephone:	+1-519-824-4120 x53393
Office:	ALEX (AXEL) 221

3 Learning Resources

3.1 Required Resource(s)

Seminar readings (Readings)

- Readings will be from scientific journals and book chapters. Reference to them and links where available will be posted to the course website on courselink.

Core lab instructions (Lab Manual)

- Instructions for the core lab will be posted to the course website the week prior for you to download and print.

3.2 Additional Resource(s)

additional resources (Other)

- Check the **course website** for additional in-course resources and information. Login with your email login and password at <http://courselink.uoguelph.ca/index.html>.
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4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Identify key processes, landforms and deposits of glacial environments and apply these to current fundamental and environmental questions in glacial geology
2. Identify and describe glacial sediments and sedimentary rocks found in different glacial environments and explain the different processes responsible for their formation
3. Apply the knowledge above to interpret the origin of glacial deposits and reconstruct the

- nature of past climatic conditions and glacial processes
4. Demonstrate the ability to find and critically evaluate literature on a specific topic in glacial geology
 5. Organize and summarize scientific information into a coherent and convincing term paper and oral presentation
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5 Teaching and Learning Activities

We will use the seminar slots on Friday to discuss scientific literature and to develop skills related to research through a couple of workshops and glacial sediment descriptions and interpretations through a core lab. The seminar discussions will give students a chance to learn to read scientific literature; readings will match the topics covered in lectures and highlight key issues in glacial geology such as challenges in reconstructing past environments, heterogeneity and modelling of systems using limited data, resolution and chronological control, preservation potential, the use of multi-proxy analyses, and the larger scale controls on the nature of glacial sedimentary successions. We will also have several workshops related to research skills: Critical Reading and Oral Presentations; Looking for sources and citation, and writing and peer review. Lastly, there will be one lab assignment where you will work on a core over several weeks during the Friday seminar slot.

5.1 Lecture

When	Topic(s)	Details
January 7 -11	Introductions, subglacial environments	Seminar-readings discussion and skills workshop 1
January 14-18	Glaciofluvial environments	Seminar: readings discussion and skills workshop 2
January 21-25	Glaciolacustrine environments	Seminar- readings discussion and skills workshop 3
January 28- February 1	Glaciomarine environments	Seminar: core lab
February 4- February 8	Origin of sediments-Marine vs terrestrial environments	Seminar: core lab

When	Topic(s)	Details
February 11-15	Snowball Earth	Seminar: readings discussion and oral presentation
February 18-22	February Break-NO CLASSES	
February 25-March 1	Hydrocarbons in glaciated basins	seminar: skills workshop 4 and readings discussion and oral presentation
March 4-March 8	Groundwater in previously glaciated basins	Seminar: skills workshop 5 and reading discussion and oral presentation
March 11-15	Catastrophic flooding from glaciers	Seminar: readings discussion and oral presentation
March 18-March 22	Heinrich events and climate change	Seminar: readings discussion and oral presentation
March 25-March 29	Ice sheet collapse and climate change	Seminar: reading discussion and oral presentation
April 1-April 5	in class review	

6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Lab assignment	15
Seminar oral presentation	15

Name	Scheme A (%)
Term paper	50
Final exam	20
Total	100

6.2 Assessment Details

Lab assignment (15%)

Due: Wed, Feb 13, 5:00 PM, courselink dropbox

Learning Outcome(s): 2,3

Seminar oral presentation (15%)

Due: throughout the term, during seminar

Learning Outcome(s): 1,4,5

Term paper (50%)

Due: Jan 30/Mar 6/Mar 13/Mar 27 by 5pm, courselink dropbox

Learning Outcome(s): 1,4,5

Outline and Bibliography due Jan 30; (10%)

Term Paper due March 6

Peer Review due March 13; (10%)

Revised Term Paper due March 27; (30%)

Final exam (20%)

Date: Fri, Apr 12, 2:30 PM - 4:30 PM, TBA

Learning Outcome(s): 1

7 Course Statements

7.1 Grading policy

Assignments are due by 5PM on the Friday of the week it is due. Please submit all assignments through the dropbox function on the course website (courselink). Policy on Late Assignments: If you cannot meet a course requirement, let me know in writing as soon as possible and preferably before the due date. Late assignment will be penalized 10% per day and will no longer be accepted a week after the due date.

7.2 Group work

Group work is encouraged when completing the lab though students have to make their own field or lab notes and write their own individual lab report.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website
<https://www.uoguelph.ca/sas>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma

programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>
